

S'Ena Arrubia Pond, Arborea

INVASIVE ALIEN SPECIES: ATLANTIC BLUE CRAB



Photo © Yiming Chen

2017

First observation reported
in Sardinia wetlands
(S'Ena Arrubia)

Atlantic blue crab

Callinectes sapidus

A crustacean native to the Atlantic coasts of the Americas, the blue crab reached the Mediterranean in ships' ballast water. It is spreading rapidly in Sardinian lagoons, affecting small-scale fisheries and biodiversity.

Why is it a concern?

- It damages fishing nets and gear, causing economic losses for fishing cooperatives and lagoon management consortia.
- It feeds on clams, other molluscs and juvenile fish, affecting shellfish farming and local fisheries.
- It disrupts the balance of lagoon ecosystems by competing with native species.

The Atlantic blue crab, *Callinectes sapidus* Rathbun, 1896 (Crustacea, Portunidae), is a decapod species native to the

Western Atlantic, from Nova Scotia to Argentina. It is an invasive alien species in the Mediterranean, characterized by high tolerance to temperature and salinity variations and a high

reproductive rate. These characteristics allow it to easily colonize coastal and lagoon environments.

In its native range, it is considered a species of great commercial importance. The blue crab was first introduced to Europe in 1900; later, its distribution range expanded, reaching the Mediterranean in 1949, in the Lagoon of Grado. Subsequently, the blue crab expanded its distribution across almost the entire Mediterranean. In Italy, it has been reported along the Ligurian, Tyrrhenian, Ionian, and Adriatic coasts. In 2017, the blue crab was observed for the first time in Sardinian lagoons, in the lagoon of S'Ena Arrubia. By the end of 2018, the species had been reported in a total of 11 sites, including lagoons, marine environments, and freshwater habitats.

Although it is not currently included among the species of Union Concern, the spread of the blue crab represents a growing problem for lagoon ecosystems, as well for for fishing and aquaculture activities which depend on them.

CURIOSITY: The name of his species comes from the Latin word *sapidus*, which means "savory" or "tasty"

Impacts and Consequences

ENVIRONMENTAL IMPACTS

The blue crab is a competitor and predator that feeds on bivalves (mussels, clams, oysters), gastropods, crustaceans, annelids, insects, fish. It represents a threat for the reduction or disappearance of native species and alterations to benthic habitats in coastal and lagoon ecosystems.

SOCIO-ECONOMIC IMPACTS

The blue crab causes economic damage to fishing and aquaculture activities. In particular, it can:

- prey on farmed bivalve;
- damages to fishing nets and gear;
- prey and damage catches of native species;
- cause injuries to fishing and aquaculture operators.

In the lagoons of the Oristano area, significant economic losses were recorded in 2024. In the San Giovanni, Marceddi and Corru S'Ittiri lagoons, annual losses exceeded €130,000: €36,000 for replacing fishing gear and approximately €100,000 in lost sales of native species.

Operational management measures

- Pesca selettiva con nasse e lavorieri, priorità alle femmine ovigere (tarda primavera–autunno).
- Registrazione sistematica delle catture accessorie (by-catch).
- Coinvolgimento della pesca ricreativa regolamentata.
- Smaltimento conforme al Reg. CE 1069/2009 per la biomassa non commercializzabile.

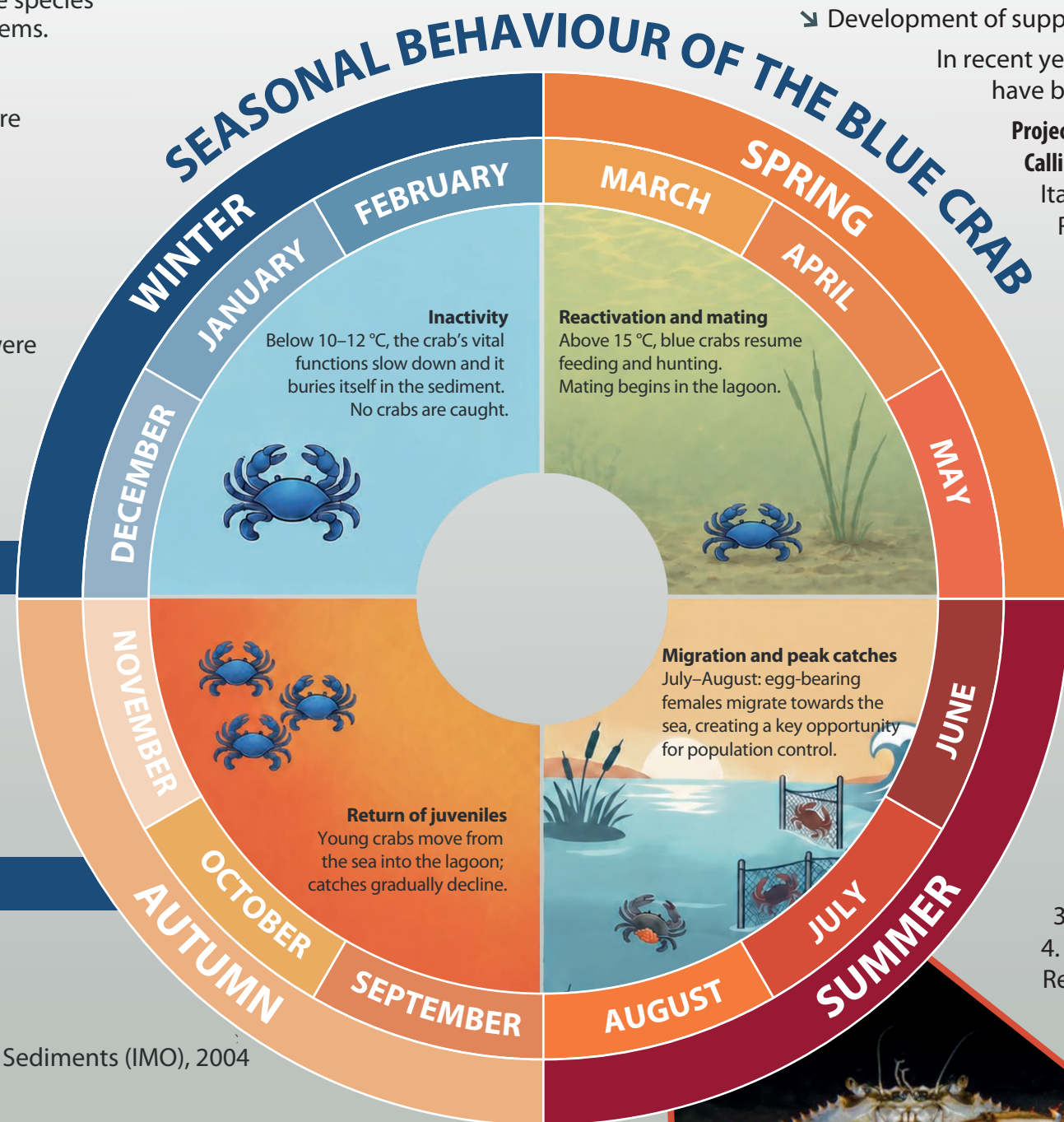
Strategies and policies

REGULATION

- Habitats Directive 92/43/EEC, Art. 22
- Convention on Biological Diversity (CBD), Art. 8
- Convention for Control and Management of Ballast Water and Sediments (IMO), 2004
- European Strategy on Invasive Alien Species
- Legislative Decree 15 December 2017, No. 230
- fish species of commercial interest (Official Gazette, 26/01/2024)
- Intervention Plan to contain the spread and proliferation *C. sapidus* (15/04/2025)
- Sardinia Regional Law N. 17/2023, Art. 8 (recognizes blue crab as an invasive alien species of regional concern)

PUBLIC BODIES INVOLVED IN MANAGING THE SPREAD OF THE BLUE CRAB

- The Italian Government, through a Special Commissioner for the blue crab;
- The Ministry of Agriculture, Food Sovereignty and Forestry (MASAF);
- The Ministry of Environment and Energy Security (MASE);
- Regional and local authorities;
- Research institutions (ISPRA, CNR, CREA) and universities.
- Fishing and aquaculture operators and trade associations of the sector



Innovative technologies, practices and projects

Among the innovative strategies developed for the management of the blue crab are:

- development of selective fishing gear and traps for catching the species
- Creation of protection systems for aquaculture and shellfish farming facilities
- Development of supply chains to bring blue crab products to market.

In recent years, several research and management projects on the blue crab have been launched in the Mediterranean and in Italy, including

Project TROPHYC- The trophic geography of marine bioinvasors: the Atlantic blue crab *Callinectes sapidus* in the Mediterranean Sea as a model species, funded by the Italian Ministry of University and Research under the Projects of Relevant National Interest (PRIN) programme, focusing on the ecological role of the blue crab in the Mediterranean.

Blue Crab Action Plan Project, an initiative funded by the National EMFAF Programme (FEAMPA) 2021-2027, aimed at studying and monitoring the spread and impact of the blue crab in the lagoon waters of Veneto, with particular reference to the north-western Adriatic lagoons, in order to assess its effects on ecosystems, biodiversity and economic activities (aquaculture and fisheries), and to develop coordinated management and environmental protection strategies

BLUECRAB Project - Control, mitigation and interventions for blue crab management: a cross-border approach, funded by Interreg Italy–Slovenia, aimed at developing an innovative monitoring system and selective fishing practices to mitigate the harmful effects of the blue crab

Operational management measures (from the Extraordinary Commissioner's 2024 Plan, adapted to Oristano lagoons:

1. Targeted removal through selective fishing, using dedicated traps and fish weirs, with priority given to egg-bearing females from late spring to autumn.
2. Management of bycatch, with systematic recording.
3. Involvement of regulated recreational fishers.
4. Disposal of biomass unsuitable for sale in accordance with Regulation (EC) No 1069/2009.

Experience in the Adriatic (Emilia-Romagna and Veneto): Large-scale, coordinated harvesting has shown that it can help limit population peaks. In the S'Ena Arrubia lagoon, local fishers are already turning the "blue crab problem" into an economic opportunity by selling their catch locally for around €10/kg.



Photo: © Le Gallais



A female can lay between **700.000** and **8 million** eggs



Ventral views of an adult female (top) and an adult male (bottom) *Callinectes sapidus*

It can survive at temperatures between **5°C** and **35°C** and at salinities of up to **48‰**

CHALLENGES AND FUTURE PROSPECTS

- Successful eradication campaigns, particularly for aquatic invasive species, require substantial time and funding and may still fail. **Complete eradication is difficult to achieve**, but careful, sustained management can substantially reduce the impacts.
- **Variation among lagoons:** Conditions differ significantly from site to site, depending on water circulation, natural freshwater inflows, the extent to which lagoon mouths are blocked by sediment, and the presence of local predators such as gilthead seabream.
- **Cooperation** among fishers, industry associations, research institutions and competent authorities is essential for joint monitoring. It also supports early detection and rapid response, helping to limit the spread of non-native species and reduce their impacts on ecosystems and economic activities

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The Wetland Observatory supports the conservation and sustainable management of wetlands in Sardinia. It collects and analyzes environmental data to monitor ecosystems, threats, and conservation strategies. Through webGIS and technical reports, it disseminates information on ecological status, biodiversity, and ecosystem services, raising awareness of the importance of wetlands in tackling climate change.

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